

FINESS2024: FInite temperature Non-Equilibrium Superfluid Systems

Sunday, September 1, 2024 - Thursday, September 5, 2024

Novotel Surfers Paradise, Gold Coast, Queensland, Australia
Program

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Sunday, September 1, 2024

Arrival (2:00 PM - 5:00 PM)

Check in at Novotel

Registration: Registration (5:00 PM - 6:00 PM)

Welcome Reception and Dinner (6:00 PM - 8:30 PM)

Monday, September 2, 2024

Coffee (8:00 AM - 8:40 AM)

Welcome (8:40 AM - 9:00 AM)

Shear flow and vortex array instabilities in annular strongly-correlated atomic superfluids (9:00 AM - 9:40 AM)

- Presenter: ROATI, Giacomo (CNR-INO)

Reynolds similitude of a pure superfluid at low temperatures (9:40 AM - 10:20 AM)

- Presenter: Prof. TAKEUCHI, Hiromitsu (Osaka Metropolitan University)

Vortices on rotating shell-shaped Bose-Einstein condensates (10:20 AM - 10:40 AM)

- Presenter: WHITE, Angela (The University of Queensland)

Morning tea (10:40 AM - 11:20 AM)

(Non equilibrium) thermodynamics of classical Integrable models in their thermodynamic limit (11:20 AM - 12:00 PM)

- Presenter: CUGLIANDOLO, Leticia

Universal dynamics in strongly interacting Bose gases far from equilibrium (12:00 PM - 12:20 PM)

- Presenter: WU, RuGway (Atominstut, Technische Universität Wien)

Thermal fluctuations in multicomponent quantum gases (12:20 PM - 12:40 PM)

- Presenter: ROY, Arko (IIT Mandi)

Lunch (12:40 PM - 2:00 PM)

Tweezers, trapped ions, and Rydbergs: a quantum simulation zoo (2:00 PM - 2:40 PM)

- Presenter: SAFAVI-NAINI, Arghavan (University of Amsterdam)

Observation of Nonlinear Response and Onsager Regression in a Photon Bose-Einstein Condensate (2:40 PM - 3:00 PM)

- Presenter: Mr LONGEN, Nikolas (Institut für Angewandte Physik, Universität Bonn, Wegelerstr. 8, 53115 Bonn, Germany)

Photon BECs in dye-filled microcavities and VCSELs (3:00 PM - 3:20 PM)

- Presenter: PELSTER, Axel (RPTU Kaiserslautern-Landau)

Super Fermi polaron and Nagaoka ferromagnetism in a two-dimensional square lattice (3:20 PM - 3:40 PM)

- Presenter: Prof. LIU, Xia-Ji (Swinburne)

Afternoon tea (3:40 PM - 4:20 PM)

Poster Slam (4:20 PM - 5:00 PM)

Posters I (5:00 PM - 7:00 PM)

time	title	presenter
5:00 PM	Vortex Dimples in Superfluid Helium Thin-Films	Mr HARVEY, Daniel Mr KELLY, Luke
5:00 PM	Critical Velocity and Vortex Nucleation for Superfluid Flow Past a Finite Obstacle	QUIRK, Charlotte
5:00 PM	Emergent Universal Drag Law in a Model of Superflow	CHRISTENHUSZ, Maarten (University of Queensland)
5:00 PM	Vortex spin in a Bose-Einstein condensate	SIMULA, Tapio
5:00 PM	Dynamics and Thermodynamics of Rabi-driven Fermi gases	MULKERIN, Brendan
5:00 PM	Quantized Vortices in Superfluid Helium Thin Films	LUU, Nicole (The University of Queensland, Australia)
5:00 PM	A nonequilibrium quantum Otto cycle in a one-dimensional Bose gas	WATSON, Raymon
5:00 PM	Towards Fermi polarons with heavy impurities	KROM, Tobias
5:00 PM	Narrow-linewidth exciton-polariton laser	Ms FABRICANTE, Bianca Rae
5:00 PM	Collective excitations of a Bose-condensed gas: Fate of second sound in the crossover regime between hydrodynamic and collisionless regimes	HIYANE, Hoshu (Okinawa Institute of Science and Technology)
5:00 PM	Microscopic many-body theory of two-dimensional coherent spectroscopy of exciton-polarons in one-dimensional materials	WANG, Jia (Swinburne University of Technology)
5:00 PM	A charged impurity in an ultracold gas: observations of cold chemistry	TRIMBY, Eleanor (University of Amsterdam)
5:00 PM	Polaron approach to quantum mixtures	LEVINSEN, Jesper (Monash University)
5:00 PM	Shear-Induced Decaying Turbulence in Bose-Einstein Condensates	SIMJANOVSKI, Simeon (The University of Queensland)
5:00 PM	Realising topological phases in the spin-1/2 quantum kicked rotor	GROSZEK, Andrew (The University of Queensland)
5:00 PM	Active matter in two dimensions	CUGLIANDOLO, Leticia
5:00 PM	Bogoliubov theory of 1D anyons in a lattice	PELSTER, Axel (RPTU Kaiserslautern-Landau)

Dinner (7:00 PM - 8:00 PM)

FINESS team trivia (8:00 PM - 10:00 PM)

Tuesday, September 3, 2024

Coffee (8:00 AM - 9:00 AM)

The Statistical Mechanics of Scalar Dark Matter (9:00 AM - 9:40 AM)

- Presenter: Dr PRESCOD-WEINSTEIN, Chanda (University of New Hampshire)

Galactic-Scale Superfluidity: True Macroscopic Condensation with Long-Range Interactions? (9:40 AM - 10:20 AM)

- Presenter: PROUKAKIS, Nick (Newcastle University)

False vacuum decay in an ultracold spin-1 Bose gas (10:20 AM - 10:40 AM)

- Presenter: BILLAM, Thomas

Morning tea (10:40 AM - 11:20 AM)

Observation of stationary turbulence in spinor Bose-Einstein condensates (11:20 AM - 12:00 PM)

- Presenter: SHIN, Yong-il (Seoul National University)

Universal coarsening in 2D and 3D Bose gases (12:00 PM - 12:20 PM)

- Presenter: GAZO, Martin

Ferrodark solitons in a spinor superfluid: exact solutions, novel speed limit and anomalous dynamics (12:20 PM - 12:40 PM)

- Presenter: Dr YU, Xiaoquan (Graduate School of China Academy of Engineering Physics)

Lunch (12:40 PM - 2:00 PM)

Hamiltonian engineering using Bragg matter-wave interferometers in an optical cavity (2:00 PM - 2:40 PM)

- Presenter: REY, Ana (JILA)

Self organisation and metastability of cavity bosons at very long times, beyond the adiabatic elimination approximation (2:40 PM - 3:00 PM)

- Presenter: DEUAR, Piotr (Insitute of Physics, Polish Academy of Sciences)

Observation of Shapiro Steps in an Atomic Superfluid (3:00 PM - 3:20 PM)

- Presenter: Prof. OTT, Herwig (RPTU Kaiserslautern-Landau)

Designing Atomtronic Circuits via Superfluid Dynamics (3:20 PM - 3:40 PM)

- Presenter: JÄHRLING, Sarah

Afternoon Tea - Wavebreak room (3:40 PM - 4:20 PM)

Free time (4:20 PM - 7:00 PM)

FINESS2024 workshop dinner (7:00 PM - 11:00 PM)

Wednesday, September 4, 2024

Coffee (8:00 AM - 9:00 AM)

Driven-dissipative spinor superfluids: a compact Kardar-Parisi-Zhang dynamics of the phase (9:00 AM - 9:40 AM)

- Presenter: Prof. SZYMANSKA, Marzena (University College London)

Exact Results of Fermi Polarons with Ultracold Atoms (9:40 AM - 10:20 AM)

- Presenter: HU, Hui

Bose polarons in a box: universal features and the effects of finite temperature (10:20 AM - 10:40 AM)

- Presenter: ETRYCH, Jiri (University of Cambridge)

Morning Tea (10:40 AM - 11:20 AM)

Non-Hermitian band geometry and dynamics of exciton-polaritons (11:20 AM - 12:00 PM)

- Presenter: ESTRECHO, Eliezer (The Australian National University)

Bose-Einstein condensation and lasing of low-dimensional semiconductor materials (12:00 PM - 12:20 PM)

- Presenter: Prof. SUN, Zheng (East China Normal University)

Coherent fraction of an equilibrium condensate (12:20 PM - 12:40 PM)

- Presenter: ALNATAH, Hassan (University of Pittsburgh)

Lunch (12:40 PM - 2:00 PM)

Wave breaking and multisoliton fission in a chip-scale superfluid waveflume (2:00 PM - 2:40 PM)

- Presenter: BAKER, Christopher (University of Queensland)

Quartet superfluid in mass-imbalanced ultracold Fermi mixtures (2:40 PM - 3:20 PM)

- Presenter: Prof. CUI, Xiaoling (Institute of Physics, Chinese Academy of Sciences)

Odd-frequency superfluidity from a particle-number-conserving perspective (3:20 PM - 3:40 PM)

- Presenter: BRAND, Joachim (Massey University)

Afternoon tea (3:40 PM - 4:20 PM)

Poster Slam (4:20 PM - 5:00 PM)

Posters II (5:00 PM - 7:00 PM)

time	title	presenter
5:00 PM	Unravelling Interaction and Temperature Contributions in Unpolarized Trapped Fermionic Atoms in the BCS Regime	PELSTER, Axel (RPTU Kaiserslautern-Landau)
5:00 PM	Quantum thermal machine regimes in the transverse-field Ising model	MURALEEDHARAN SAJITHA, Vishnu

5:00 PM	Universal description of massive vortices in superfluids	Prof. TAKEUCHI, Hiromitsu (Osaka Metropolitan University)
5:00 PM	Signatures of many-body localization of quasiparticles in a flat band superconductor	SWAMINATHAN, Koushik (Aalto University)
5:00 PM	Nonequilibrium Transport in a Superfluid Josephson Junction Chain: Is There Negative Differential Conductivity?	BEGG, Samuel (Oklahoma State University)
5:00 PM	On Demand Formation of Topological Defects in Ferromagnetic Spinor Bose Einstein Condensates	KERR, Zac (The University of Queensland)
5:00 PM	Vortex matter simulation of the one component plasma	NEELY, Tyler (University of Queensland)
5:00 PM	Equatorial waves in rotating bubble-trapped superfluids	EFIMKIN, Dmitry (Monash University)
5:00 PM	Work, heat and entropy in isolated quantum systems	WILLIAMSON, Lewis
5:00 PM	Exploring the dynamics of polar core vortices in homogeneous spin-1 Bose-Einstein condensates	EDMONDS, Matthew (University of Queensland)
5:00 PM	Phononic crystal trapping geometries for improved rotational sensing with ultracold atoms	MILLER, Lachlan
5:00 PM	Tensor network methods for the Gross-Pitaevskii equation	CONNOR, Ryan (University of Strathclyde)
5:00 PM	Non-perturbative corrections to the weakly interacting two component Fermi gas	PELSTER, Axel (RPTU Kaiserslautern-Landau)
5:00 PM	Non-Hermitian dynamics of a photonic wave packet in a microcavity filled with a liquid crystal	KRÓL, Mateusz (The Australian National University)
5:00 PM	Heteronuclear mixtures: From Efimov effect to heavy Fermi polarons	RAUTENBERG, Michael (PI Uni Heidelberg)
5:00 PM	Fractal spectrum and dimension extension of twisted bilayer optical lattices in ultracold atoms	SHI, Zheyu

Dinner (7:00 PM - 8:00 PM)

Social event (8:00 PM - 10:00 PM)

Thursday, September 5, 2024

Coffee (8:00 AM - 9:00 AM)

Phase transitions and nonequilibrium dynamics in driven quantum matter (9:00 AM - 9:40 AM)

- Presenter: WELD, David (UC Santa Barbara)

Imaginary gauge potentials in a non-Hermitian spin-orbit coupled quantum gas (9:40 AM - 10:20 AM)

- Presenter: SPIELMAN, Ian

Creating and Manipulating Dirac Strings in Spinor Condensate (10:20 AM - 10:40 AM)

- Presenter: PU, Han (Rice University)

Morning tea (10:40 AM - 11:20 AM)

Medium-enhanced repulsion between polaron quasiparticles in a quantum gas (11:20 AM - 12:00 PM)

- Presenter: PARISH, Meera

An Efficient Quantum Phase-Space Method for Simulating Feedback Control of Interacting Many-Body Quantum Systems (12:00 PM - 12:20 PM)

- Presenter: HAINE, Simon

How to deduce the entropy from atom-atom correlations (12:20 PM - 12:40 PM)

- Presenter: KHERUNTSYAN, Karen

Closing statements and lunch (12:40 PM - 2:00 PM)

Departure (2:00 PM - 2:20 PM)